

Need To Know Checklist

Foundations of Math and Pre-Calculus 10

Unit 2: Roots and Powers

Textbook: Ch 4 (pg 204-249)

Vocabulary

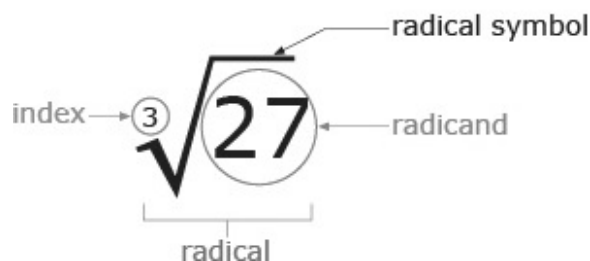
Rational Number- a number that can be written in the form $\frac{m}{n}$; $n \neq 0$. A rational number has decimal representations that either terminate or repeat. For example, $\sqrt{4}=2$, $\frac{7}{6}$

Irrational Number- a number that cannot be written in the form $\frac{m}{n}$; $n \neq 0$ where m and n are integers. The decimal representation of an irrational number neither terminates nor repeats. For example, $\sqrt{2}=1.414213562...$

Real Number- any number that is a rational or irrational number.

Radical- an expression consisting of a radical sign, a radicand and an index; for example, $\sqrt[3]{64}$

Parts of a Radical



Radicand- the number under the radical sign; for example, 81 is the radicand of $\sqrt{81}$

Index- in a radical, the number above the radical symbol that indicates which root is to be taken; for example, 3 is the index in the radical $\sqrt[3]{81}$. If the index is not written, it is assumed to be 2.

Entire Radical- a radical sign and the number underneath it (i.e. $\sqrt[5]{32}$)

Mixed Radical- a number written as the product of another number and a radical (i.e. $3\sqrt{5}$)

Rational Exponent Law

$$a^{m/n} = \sqrt[n]{a^m} \quad \text{or} \quad \left(\sqrt[n]{a}\right)^m$$

Checklist

- ☐ I understand the difference between rational and irrational numbers.
- ☐ I am able to determine if a number, radical, or fraction is rational or irrational.
- ☐ I am able to simplify perfect roots.
- ☐ I am able to simplify non-perfect roots without a calculator (using factors)
- ☐ I am able to order irrational numbers on a number line.
- ☐ I am able to express entire radicals as mixed radicals.
 - I understand the multiplication property of radicals
- ☐ I am able to turn a mixed radical back into an entire radical
- ☐ I understand the rational exponent law
 - When an exponent is a fraction, I am able to express it as a radical.
- ☐ I understand negative exponents and can use them to simplify an expression.
- ☐ I have reviewed and understand the exponent laws and can use them to simplify expressions

Exponent Law	
Note that a and b are rational or variable bases and m and n are integral exponents.	
Product of Powers	$(a^m)(a^n) = a^{m+n}$
Quotient of Powers	$\frac{a^m}{a^n} = a^{m-n}, a \neq 0$
Power of a Power	$(a^m)^n = a^{mn}$
Power of a Product	$(ab)^m = (a^m)(b^m)$
Power of a Quotient	$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}, b \neq 0$
Zero Exponent	$a^0 = 1, a \neq 0$